

Summary: Michigan Department of Agriculture Groundwater Monitoring Program Ag Expo 2004

The Michigan Department of Agriculture (MDA) and the Michigan Groundwater Stewardship Program sponsored a domestic well water sample screening at the 2004 Michigan State University Agricultural Exposition (Ag Expo). MDA laboratory staff screened 2,563 samples for atrazine, nitrate, and nitrite. This was an increase of 742 samples over Ag Expo 2003. Samples were submitted with a short questionnaire about well characteristics and land use. There were 28 counties that showed an increase of 10 or more samples at the screening. Oceana, Kalamazoo, and Mason Counties all sent approximately 100 more samples to the screening, compared to Ag Expo 2003.

Samples were tested for the presence of the triazine herbicide *atrazine* using ELISA (enzyme-linked immunosorbent assay) methods. The ELISA kits used also react in varying degrees to other triazines, including simazine and prometon, and some triazine breakdown products.

Samples were screened for nitrate and nitrite using a simple strip test. Test strips were dipped in samples, and color development on the strip was compared to standards and color charts to estimate nitrate and nitrite concentrations.

Atrazine: Results showed 19 samples tested positive for atrazine or other triazines. Of those, 6 tested positive at trace levels, between 0.07 and 0.09 µg/L (micrograms per liter, equivalent to parts-per-billion, or ppb). Samples from 12 wells had triazine levels between 0.1 and 0.6 µg/L, and 1 sample tested positive at 0.85 µg/L. This was the highest concentration found during the 2004 screening. A Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in a public water supply. MCLs are enforceable standards for public water supplies. The MCL for atrazine in drinking water is 3 µg/L.

Nitrite: 14 samples tested positive for nitrite, at a detection limit of 0.15 mg/L Nitrite-N, (milligrams/liter nitrite as nitrogen, equivalent to parts-per-million or ppm). The highest level detected was 1.5 mg/L nitrite-N, a level above the nitrite MCL of 1 mg/L. The well is shallow, and is fairly close to a septic system. Three other samples tested positive for nitrite at levels of 1 mg/L, equal to the nitrite MCL. All three had elevated nitrate levels (10 mg/L nitrate-N or higher). Two of the three were associated with agricultural production, and one was located in a residential setting.

Nitrate results are summarized in the table below. The nitrate MCL is 10 mg/L nitrate-N.

Table 1. Nitrate results for the Ag Expo 2004 MDA domestic well screening.

Ag Expo 2004 Well Screening Results for Nitrate						
	Nitrate-N Levels in ppm (parts-per-million, equivalent to mg/L)					Total Samples
	≤1	≥2 and<5	≥5 and<10	≥10 and ≤20	>20	
Total and Percent of Total by Nitrate-N Level	1866 72.8%	307 12.0%	245 9.6%	131 5.1%	14 0.5%	2563 100%

Letters containing results were mailed to all participants. Recommendations for further action were included in the letters for participants with triazine detections, or with elevated nitrate or nitrite detections. Free resamples were offered to all participants with a triazine detection.